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APPLYING LEARNING OF SCIENTIFIC APPROACH WITH GUIDED DISCOVERY MODEL TO IMPROVE STUDENT LEARNING OUTCOMES FOR STATIC FLUID

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Abstract

The aim of this research are to described the learning implementation, analyzing the student learning outcomes improvement, and describe the response of students after applied learning of scientific approach with guided discovery model. This research's location in SMA Al-Islam Krian with sample students from class XI MIPA 1, XI MIPA 2, and XI MIPA 3. The methods of collecting data are validation, test, observation, and questionnaire. The analysis from this research use validation, learning activity sheet analysis, *n-gain score*, and response questionnaire analysis. Based on this research obtained result that : 1) Implementation from learning of scientific approach with guided discovery model get 100%, its mean that all learning steps have done well, 2) Student learning outcomes in knowledge competence are improving with *n-gain score* in experiment class is 0,534, in class replication 1 is 0,503, and in class replication 2 is 0,494; every class get medium category, average interpretation score in experiment class is 82,28; class replication 1 is 80,92; and class replication 2 is 79,45. 3) Response of students to learning of scientific approach with guided discovery model get 81,79% with very good category. Based on result above can be concluded that learning of scientific approach with guided discovery model can improve student learning outcomes with medium category.

Keywords: scientific approach, guided discovery, learning outcomes, static fluid.

INTRODUCTION

Approaching and Modeling in the learning in every learning activity is used to optimize student's comprehension in studying so that students get good learning outcomes. To selection of a learning model, teacher must adapt learning model that suitable with materials characteristics, students characteristics, environment characteristics, and its context (Wisudawati dan Sulistyowati, 2013). To get reach objective in a learning, so learning process in classroom must be planned well. One of lesson in senior high school that need a learning strategy that contain demonstration and experiment is physics. Therefore, approaching that suitable with physics learning is scientific approach because students will more active in experiment.

Based on pre-research result in senior high school Al Islam Krian to 35 students from XI MIPA, 71,43% students state that teacher more dominant than students in physics learning. Meanwhile in physics experiment activity, 68,57% students state that rarely held experiment in every chapters. Even thought, 88,57% students state that they more interested for studying physics with experiment that leads to discovery activities. From that applying learning get effect to student learning outcomes in static fluid that under graduation criteria (graduation criteria = 70) until 62% with average value is 66,9.

Based on that reality, then it needs to be applied learning model that make students give actively participate actively so that student learning outcomes is suitable with objective which are expected. One of learning model that give student participate actively and contain demonstration and experiment is guided discovery. Guided discovery model is engaging students to built concept under the supervision of teacher that make students learn actively to find knowledge by their self (Sani, 2014). In this learning model, students are expected to understanding and memorizing the lesson learned. So, guided discovery model is suitable with implementation of learning in curriculum 2013.

Guided discovery model can be applied in chapter of static fluid that in learning objective, students are required to participate actively through demonstration activities and experiment in group discussions. The expectation of using guided discovery model are students not only get information, but also students gain skills thinking, attitude, and process skills. Thus the learning objective and student learning outcomes can be achieved well.

Previous research on the guided discovery model has yielded positive results. Isnaini's research (2014) about the development of learning materials oriented guided discovery model, obtained a satisfactory learning outcomes, that knowledge competence obtained on average B (3,08), competence of skills and attitudes are also average B (3,00). While for the its learning get student response with percentage scale between 76% - 100% agree and support learning from the research. Fardidin's research (2015) which also developed a learning materials oriented guided discovery model, obtained 100% student learning achievement with average for the competence of attitude, knowledge and skills in succession of SB, 3,46 and A-. Student responses

to the learning implementation using the developed device obtained an average percentage of 84.37% with very good category.

Research of Uside, et all (2013) in Kenya about the effect of Discovery Experimental Method on student achievement compared to Teacher Demonstration Method. The results show that Discovery Experimental Method has a significant influence on student achievement by improving memory of knowledge and instilling self-esteem. Research of Abdisa and Getinet (2012) which is compares guided discovery methods, demonstration methods, and traditional methods. The results show that the guided discovery method is most effective in learning (with an average gain score of 0.43), demonstration methods (average gain score 0.34), and traditional methods (average gain score 0.26). Research of Akinbobola and Afolabi (2010) showed that after being taught using a set of cards, the guided discovery approach was more effective in supporting student achievement in physics than in demonstration and expository approaches. The following results show no significant gender effect (male and female) on student achievement in physics learning either using guided discovery, demonstration or expository approach.

From the description above, the researcher conducts research with the title, "Applying Learning of Scientific Approach with Guided Discovery Model to Improve Student Learning Outcomes in Static Fluid". The aim of this research are to described the learning implementation, analyzing the student learning outcomes improvement, and describe the response of students after applied learning of scientific approach with guided discovery model.

METHOD

This research design use One Group Pretest-Posttest Design with one experiment class and two classes of replication. Design research that will be done can be written as follows:

$O_1 \longrightarrow X \longrightarrow O_2$

(Sugiyono, 2012)

Information :

O_1 : Pretest

X : Learning of scientific approach with guided discovery model

O2: Posttest

In this research, the subjects of the research are the students of class XI MIPA 1, XI MIPA 2 and XI MIPA 3 in senior high school Al Islam Krian with the number of students as many as 20 students for class XI MIPA 1, 36 students for class XI MIPA 2, and 36 students for class XI MIPA 3. Data collection techniques that used in this research are validation, tests, observations, and questionnaires. The analysis from this research use validation, learning activity sheet analysis, *n-gain score*, and response questionnaire analysis.

For validation of learning materials is done by two lecturers of learning field. This research is also assisted by two teachers to observe the learning implementation.

RESULT AND DISCUSSION

Based on the research that has been done, obtained data as follows :

1. Analysis of Learning Implementation

Analysis of learning implementation is using sheets of observation learning to know the activities of teachers in implementing learning. This observation sheet is filled by two observers by filling out the observation sheet of the learning process correctly in accordance with the lesson Plan that has been made. Percentage of learning activities from all meetings can be seen in table 1

Table 1. Result of percentage learning implementation

Class	Presentage of meeting				Category
	1	2	3	4	
Experiment (XI MIPA 1)	100%	100%	100%	100%	Very good
Replication 1 (XI MIPA 2)	100%	100%	100%	100%	Very good
Replication 2 (XI MIPA 3)	100%	100%	100%	100%	Very good

Based on the table shows that learning implementation has been done by researcher has been suitable with the implementation of lesson plan that has been made

2. Analysis of Learning Outcome

Learning outcomes in this research based on pretest and posttest. For learning outcomes in knowledge competence, the data can be analyzed by using the n-gain score. The results of the average n-gain score analysis are presented in table 2

Table 2. The results of the average n-gain score analysis

Class	XI MIPA 1 (experiment)		XI MIPA 2 (replication 1)		XI MIPA 3 (replication 2)	
	<g>	Category	<g>	Category	<g>	Category
Average	0,534	Medium	0,503	Medium	0,494	Medium

That table shows that there are improvements with medium category in student learning outcomes after applying learning of scientific approach with guided discovery model.

3. Analysis of Student Response

Student response can be known through the student's response questionnaire used to determine student's responses and interests after following the teaching and learning activities in the classroom. The result of student's response can be shown in table 3

Table 3. The Result of Student's Response

Statement	Total Answer and Percentage		Category
	Yes	No	
1. Teacher shows phenomenon	80 86,96%	12 13,04%	Very Good
2. Students are always curious	76 82,61%	16 17,39%	Very Good
3. Students become curious about materials	70 76,09%	22 23,91%	Good
4. Students become courageous for asking	74 80,43%	18 19,57%	Very Good
5. Student connect learning with life	77 83,70%	15 16,30%	Very Good
6. Students become courageous for giving aspiration	72 78,26%	20 21,74%	Good
7. Student learning outcomes	Good 68 73,91%	Not Good 24 26,09%	Good
8. Students are interested in learning physics by discovery activities	85 92,39%	7 7,61%	Very Good
Applying Learning Based on Student's Response	81,79%		Very Good

Based on the table above, applying learning based on student's response get 81,79% with very good category. It mean that students give response positive for learning of scientific approach with guided discovery model.

Based on the data of all analysis above, there are improvements of student learning outcomes with medium category. Learning outcomes have increased because implementation of learning is very good so the students in this learning are actively involved in learning (Markaban, 2008) and give response positive for learning of scientific approach with guided discovery model. Improvement of student learning outcomes get medium category is because in practice in the field, students are still familiar with the lecture model (Markaban, 2008). So that need to adapt first for following learning of scientific approach guided discovery model. Researcher should explain in detail and give examples of stages from learning process that will be applied.

CLOSING

Conclusion

Based on the results of research and discussion that have been presented above, it can be concluded that:

1. Learning Implementation is suitable with learning activities of scientific approach with guided discovery model.
2. Learning of scientific approach with guided discovery model can improve learning outcomes in knowledge competence of students in the experimental class, replication 1, and replication 2 with each improved medium category learning outcomes.
3. Applying learning of scientific approach with guided discovery model on static fluid get positive response from students.

Based on result above can be concluded that learning of scientific approach with guided discovery model can improve student learning outcomes with medium category.

Suggestion

1. Need to adaptation process of students before applying learning of scientific approach with guided discovery model.
2. Need to increase the allocation of learning time for better learning outcomes.
3. It is hoped that the learning of scientific approach with guided discovery model can be applied to other physics material.

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